

REMARKS

Reconsideration of this application is respectfully requested. In the Office Action, claims 1-20 were pending and claims 1-20 were rejected. In this response, no claim has been canceled or added or amended. Thus, claims 1-20 are pending. No new matter is added.

Claim Rejections – 35 U.S.C. § 103(a)

CLAIMS 1-5, 11, 12, and 15

Claims 1-5, 11, 12, and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chandley et al. (U.S. 7, 389,432 B2). Claim 1 recites,

A computer implemented method, comprising:
in a normal power state, directly storing pixels of a color plane of image data in a first segment and a second segment of a frame buffer;
in a low power state, performing an error diffusion operation on the pixels to reduce a color depth of the pixels, the normal and low power states are independent and switchable from each other; and
storing at least a portion of the pixels with reduced color depth in the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state.
(Emphasis added)

Chandley teaches a method and system for power management of mobile computer displays, in which areas of the screen are selectively controlled to consume less power than other areas. (Chandley, Abstract). Applicants respectfully submit that claim 1 is patentable over the cited reference because Chandley fails to teach or suggest all of the features of the claim.

First of all, Chandley fails to teach or suggest how to store image data in a frame buffer. Instead, Chandley teaches how to read from a frame buffer. In fact, Chandley only

mentioned “frame buffers” in his patent once in that “[t]he display driver/hardware 208 may comprise a conventional adapter that refreshes the screen with data from one or more frame buffers at a refresh rate that applies to the entire screen.” (Chandley, col. 7, lines 31-39). In contrast, claim 1 recites the feature of “in a normal power state, directly storing pixels of a color plane of image data in a first segment and a second segment of a frame buffer” and the feature of “storing at least a portion of the pixels with reduced color depth in the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state.”

Next, Chandley fails to teach or suggest the feature of “in a low power state, performing an error diffusion operation on the pixels to reduce a color depth of the pixels,” as set forth in claim 1. Rather, Chandley teaches how to reduce power consumption by lowering its refresh rate to a screen area. According to Chandley, “[a]nother way to reduce power to a screen area is to lower its refresh rate relative to other areas.” (Chandley, col. 9, lines 17-18). For example, Chandley teaches that for a RGB level of {25, 129, 242}, “the same RGB values at a two-thirds refresh rate may be accomplished by sending {0, 129, 242} for the first frame, {25, 0, 242} for the second frame and {25, 129, 0} for the third frame.” (Chandley, col. 9, lines 22-34). As shown, lowering refresh rate to reduce power consumption in selected screen area, as taught by Chandley, is not equivalent to the feature of “in a low power state, performing an error diffusion operation on the pixels to reduce a color depth of the pixels,” as recited in claim 1.

Furthermore, even though Chandley describes that “[o]ther example ways to reduce power consumption in selected areas include ... changing the color depth (number of bits per pixel)...,” Chandley merely briefly mentions that “instead of handling twenty four bits per pixel, only the first five bits may be considered.” (Chandley, col. 2, lines 47-49; col. 10, lines

17-20). Because Chandley does not provide any detailed color depth implementations in his patent, it appears from the statement above that Chandley simply reduces the number of bits per pixel when changing the color depth of pixels. In contrast, claim 1 recites the feature of “performing an error diffusion operation on the pixels to reduce a color depth of the pixels.” As a matter of fact, Chandley does not even teach or suggest the feature of “error diffusion” at all.

In addition, because Chandley does not teach or suggest the feature of a frame buffer with at least two segments, the Office Action states that “[i]t would be obvious that each bit or set of bits would occupy segments within the frame buffer because modern memory systems are divided into an addressable space for locating, retrieving, or writing data to.” (Office Action, 06/23/09, page 3). Applicants respectfully disagree with the Office Action’s statement mentioned-above. Claim 1 not only recites the feature of a frame buffer having a first segment and a second segment, but also recites the feature of “in a normal power state, directly storing pixels of a color plane of image data in a first segment and a second segment of a frame buffer...storing at least a portion of the pixels with reduced color depth in the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state,” which is not obvious to one of ordinary skill in the art.

Finally, because the Office Action provides only one cited reference, Chandley, it appears that the Office Action is relying on facts which are not of record as common knowledge in order to arrive at an unsubstantiated conclusion that the claim feature would be obvious. It is respectfully submitted that it would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. (MPEP 2144.03(A)). The Examiner’s attention is respectfully directed to MPEP 2144.03(C),

which states “[i]f the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding. See 37 CFR 1.104(d)(2).”

If the Examiner maintains the rejection, Applicants respectfully request that Examiner provide evidentiary support of the Examiner’s alleged facts which are not of record as being common knowledge. Absent such submission of evidentiary support, Applicant submits that the rejection of claims 1 and 21 under 35 U. S. C. § 103(a) based solely on Chandley does not render the claims unpatentable.

Because Chandley fails to teach or suggest all of the features of claim 1, claim 1 is patentable over the cited reference.

Given that claims 2-5 and 11 directly or indirectly depend from independent claim 1, and incorporates all of the features of claim 1, for at least the reasons stated with respect to claim 1, claims 2-5 and 11 are patentable over the cited reference.

With respect to claim 12, similar to the reasons stated for claim 1, Chandley fails to teach or suggest all of the features of claim 12. In particular, Chandley fails to teach the features of “in a normal power state, directly storing pixels of a color plane of image data in a first segment and a second segment of a frame buffer; in a low power state, performing an error diffusion operation on the pixels to reduce a color depth of the pixels” and the feature of “storing at least a portion of the pixels with reduced color depth in the first segment of the frame buffer during the low power state without accessing the second segment of the frame buffer,” as set forth in claim 12. Accordingly, claim 12 is patentable over the cited reference.

With respect to claim 15, similar to the reasons stated for claim 1, Chandley fails to teach or suggest all of the features of claim 15. In particular, Chandley fails to teach the feature of “a frame buffer having a first segment and a second segment, an encoder coupled to the frame buffer and configured to store pixels of a color plane of image data in the first and second segments of the frame buffer during a normal power state, perform an error diffusion operation on the pixels to reduce a color depth of the pixels during a low power state, the normal and low power states being independent and switchable from each other, and store at least a portion of the pixels with reduced color depth in the first segment of the frame buffer during the low power state without accessing the second segment of the frame buffer,” as set forth in claim 15. Because Chandley fails to teach or suggest all of the features of claim 15, claim 15 is patentable over the cited reference.

Accordingly, Applicants respectfully request that the rejections of claims 1-5, 11, 12, and 15 be withdrawn.

CLAIMS 6-10, 13, 14, and 16-20

Claims 6-10, 13, 14, and 16-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chandley et al. (U.S. 7, 389,432 B2) in view of Zhang et al. (U.S. 2006/0077489A1). Specifically, claim 18 recites:

A computer implemented method, comprising:
during a low power state of a frame buffer having a first segment and a second segment, for each source pixel of each color plane of image data, calculating an output value corresponding to a source pixel value of the source pixel according to a predetermined algorithm;
calculating an error between the output value and the source pixel value;
diffusing the error to up to two neighboring pixels of the source pixel; and

storing the output value of the source pixel and the diffused up to two neighboring pixels to the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state of the frame buffer.
(Emphasis added)

The Office Action purports that Chandley teaches the feature of “for each source pixel of each color plane of image data, calculating an output value corresponding to a source pixel value of the source pixel according to a predetermined algorithm” in column 9, lines 29-39 and further states that Chandley teaches that “two channels of a source pixel are used during a refresh.” (Office Action, 06/23/09, pages 9-10). However, the above-mentioned section in Chandley does not teach anything about “two channels of a source pixel.” As discussed above, Chandley merely teaches how to reduce the refresh rate of a screen area by either skip reading from a frame buffer or skip reading one of the RGB colors, which does not involve any calculations. As such, Chandley does not teach or suggest the feature of “calculating an output value corresponding to a source pixel value of the source pixel according to a predetermined algorithm,” as recited in claim 18.

Similar to the reasons stated with respect to claim 1, Chandley also fails to teach or suggest the feature of “storing the output value of the source pixel ... to the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state of the frame buffer,” as set forth in claim 18.

The Office Action acknowledges that “Chandley does not clearly disclose calculating an error between the output value and the source pixel value; diffusing the error to up to two neighboring pixels of the source pixel; and storing the diffused up to two neighboring pixels to the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state of the frame buffer.” (Office Action, 06/23/09, page 10;

emphasis added). However, the Office Action states that Zhang discloses the above-mentioned features in paragraph [0052]. (Id.). Applicants respectfully disagree with the Office Action's interpretation of Zhang.

Zhang provides a halftoned image compensation for rendering device non-uniformities. (Zhang, Abstract). Although Zhang describes that "an error diffusion process includes ... calculating an error value based on the pixel value and the marking decision and diffusing error to neighboring pixel with the diffusion mask based on the calculated error," Zhang also fails to teach or suggest the feature of "storing ... the diffused up to two neighboring pixels to the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state of the frame buffer," as recited in claim 18. (Zhang, paragraph [0052]). Furthermore, as discussed above, Chandley fails to teach or suggest all of the features of claim 18, and Zhang does not cure the deficiencies of Chandley.

Furthermore, no motivation or suggestion could be found, either in the cited references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the references teachings. Even when the cited references could be combined, the combination does not provide the same features as set forth in claim 18.

Because Chandley in view of Zhang fails to teach or suggest all of the features of claim 18, claim 18 is patentable over the cited references.

Given that claims 6-10, 13, 14, 16, 17, 19, and 20 directly or indirectly depend from independent claims 1, 12, 15, and 18, and incorporate all of the features of their respective independent claims. For at least the reasons stated above, claims 6-10, 13, 14, 16, 17, 19, and 20 are patentable over the cited references.

Accordingly, Applicants respectfully request that the rejection of claims 6-10, 13, 14, and 16-20 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

In view of the foregoing, Applicants respectfully submit the present application is now in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call/email the undersigned attorney.

Please charge Deposit Account No. 02-2666 for any shortage of fees in connection with this response.

Respectfully submitted,

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